



Microlithography NA TC Chapter Meeting Summary and Minutes

Web Conference
Tuesday, March 28, 2023
9:00 AM – 11:00 AM Pacific

TC Chapter Announcements

Next TC Chapter Meeting
October 31, 2023, 9:00 AM – 11:00 AM Pacific

Table 1 Meeting Attendees

Italics indicate virtual participants

Co-Chairs: Bryan Barnes

SEMI Staff: Kevin Nguyen

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
<i>Intel</i>	<i>Abboud</i>	<i>Frank</i>	<i>HJL Lithography</i>	<i>Levinson</i>	<i>Harry</i>
<i>NIST</i>	<i>Barnes</i>	<i>Bryan</i>	<i>KLA</i>	<i>LoPresti</i>	<i>Patrick</i>
<i>Mentor Graphics, Siemens</i>	<i>Durvasula</i>	<i>Bhardwaj</i>	<i>XYALIS</i>	<i>Morey</i>	<i>Philippe</i>
<i>Siemens</i>	<i>Gharat</i>	<i>Sayalee</i>	<i>TSMC</i>	<i>Peng</i>	<i>Danping</i>
<i>Nippon Control System</i>	<i>Hamaji</i>	<i>Masakazu</i>	<i>Intel</i>	<i>Sundaramurthy</i>	<i>Arvind</i>
<i>Synopsys</i>	<i>Jonaris</i>	<i>George</i>	<i>ASML</i>	<i>Wampler</i>	<i>Kurt</i>
<i>Imec</i>	<i>Kerkhove</i>	<i>Jeroen</i>	<i>Vistec Electron Beam</i>	<i>Weidenmueller</i>	<i>Ulf</i>
<i>Mentor Graphics, Siemens</i>	<i>Kim</i>	<i>Stephen</i>	<i>TSMC</i>	<i>Ying</i>	<i>Changsheng</i>

Table 2 Leadership Changes

<i>WG/TF/SC/TC Name</i>	<i>Previous Leader</i>	<i>New Leader</i>

Table 3 TC Chapter Structure Changes

<i>Previous WG/TF/SC Name</i>	<i>New WG/TF/SC Name or Status Change</i>

Table 4 Ballot Results

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
6821	New Preliminary Standard: Specification For Experimental Curvilinear “Multigon” Extension To SEMI P39 OASIS	Approved

#1 **Passed** ballots and line items will be submitted to the ISC Audit & Review Subcommittee for procedural review.

#2 **Failed** ballots and line items were returned to the originating task forces for re-work and re-balloting or abandoning.

Table 5 Ratification Ballot Results

<i>Document #</i>	<i>Document Title</i>	<i>ISC A&R Action</i>	<i>A&R Forms</i>
None			



Table 6 Activities Approved by the GCS between meetings of the TC Chapter

#	Type	SC/TF/WG	Details
None			

Table 7 Authorized Activities

Listing of all revised or new SNARF(s) approved by the Originating TC Chapter.

#	Type	SC/TF/WG	Details
7026	SNARF	TC Chapter	Reapproval of SEMI P44-1216 Specification for Open Artwork System Interchange Standard (OASIS ®) Specific to Mask Tools
7027	SNARF	TC Chapter	Reapproval of SEMI P39-0416 Specification for OASIS® – Open Artwork System Interchange Standard

#1 SNARFs and TFOFs are available for review on the SEMI Web site at:

<http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF>

Table 8 Authorized Ballots

#	When	TF	Details
7026	cycle 4-23	TC Chapter	Reapproval of SEMI P44-1216 Specification for Open Artwork System Interchange Standard (OASIS ®) Specific to Mask Tools
7027	cycle 4-23	TC Chapter	Reapproval of SEMI P39-0416 Specification for OASIS® – Open Artwork System Interchange Standard

Table 9 SNARF(s) Granted a One-Year Extension

#	TF	Title	Expiration Date
6516	P47 Revision TF	Revision to SEMI P47, Test Method for Evaluation of Line-Edge Roughness and Linewidth Roughness	03/28/2024

Table 10 SNARF(s) Abolished

#	TF	Title
6220	Patterning Metrology TF	Line Item Revision to SEMI P19-92 (Reapproved 0707), Specification For Metrology Pattern Cells For Integrated Circuit Manufacture
6221	Patterning Metrology TF	Revision to SEMI P18-92 (Reapproved 1104), Specification For Overlay Capabilities Of Wafer Steppers

Table 11 Standard(s) to receive Inactive Status

Standard Designation	Title
None	

Table 12 New Action Items

Item #	Assigned to	Details
March2023-#1	Kevin Nguyen (SEMI)	To send doc.6821, New Preliminary Standard: Specification For Experimental Curvilinear “Multigon” Extension to SEMI P39 OASIS, to ISC for procedural review.

Table 13 Previous Meeting Action Items

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>	<i>Status</i>
July2021-#1	Kevin Nguyen (SEMI)	To set up a depository web site for the new Curvilinear TF	Completed

1 Welcome, Reminders, and Introductions

1.1 Bryan Barnes called the meeting to order at 9:00 AM. Before the meeting started, Bryan reminded all that there is an opening for a second co-chair. If anyone is interested, please inform him or SEMI staff.

1.2 The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

2 Review of Previous Meeting Minutes

2.1 The TC Chapter reviewed the minutes of the previous meeting.

- Motion:** Accept the minutes as written
- By / 2nd:** Harry Levinson /Stephen Kim
- Discussion:** None
- Vote:** 11-0. Motion passed.

Attachment: 01, Microlithography NA TC Minutes 07142021

3 SEMI Staff Report

3.1 Kevin Nguyen (SEMI) gave the SEMI Staff Report. Of note:

- SEMI upcoming event
 - SEMICON West, July 10-13, 2023
 - San Francisco, CA
- 2023 Critical Dates for SEMI Standards Ballots
 - <https://www.semi.org/en/collaborate/standards/ballots>
- SEMI University
 - More than 360 on-demand courses created specifically for the semiconductor industry
 - www.semi.org/en/semi-university
- SEMI Standards Publications
 - Total SEMI Standards in portfolio: 1,075
 - Includes 320 Inactive Standards
- Regulations and Procedure Manual Updates

Attachment: 02, Staff Report March 2023 v1

4 Ballot Review

NOTE 1: TC Chapter adjudication on ballots reviewed is detailed in the Audits & Review (A&R) Subcommittee Forms for procedural review. The A&R forms are available as attachments to these minutes. The attachment number for each balloted document is provided under each ballot review section below.

4.1 Doc.6821, New Preliminary Standard: Specification For Experimental Curvilinear “Multigon” Extension To SEMI P39 OASIS

Motion: To approve as a preliminary standard.

By: Danping Peng / Taiwan Semiconductor Manufacturing Company

Second: Frank Abboud / Intel

Discussion:

- Kurt Wampler: For the purpose of addressing inverse lithography on mask, path is poor choice due to its fixed width, not represent like spaghetti. Path is too controversial and the WG would have spent twice as long and may need an entire second distinct record. Multigon records are preferred. There are controversies, the WG chose the preliminary standard approach so people can do the hard work by implementing the software to use this format. In doing so, implementers can discover oversight or improvement as the process is evolved.
- Patrick LoPresti: This will be approved as a preliminary standard, which has two years life, how much room do we have to change? There are parts of the standards that he does not like. The primary concern is interoperability. Multigone records still have several unfavorable aspects. Different tools will interpret differently due to ambiguity. More work is needed before this can be approved as standard.
- Frank Abboud: This is a living document, and it can be changed over time as needed. Lot of works have been put up to this point. If Patrick or anyone has any ideas that benefit everyone, this WG is open for improvement. So don't treat this document as it is locked.
- Arvind Sundaramurthy: This is chicken and egg concept. We need the standard first, then implement it. Once issues are found, we can change it later.
- Bhardwaj Durvasula: Shared the same genuine concern with Patrick LoPresti. From an EDA vendor, he faces a similar issue, so it is good to hear this out and know that changes can be made later as required. So far, issues uncovered will not require lot of rework to support the multigon concept. The customer will need to be on board. He looks forward for more EDA vendors and companies to experience this format, and uncover any new issues.
- Philippe Morey: As an EDA vendor, he shared the same concern as Patrick LoPresti. There are some ambiguity remains. From his experience, if this standard is implemented, it may be quite difficult to come back and change it later. Thus, it is better to fix ambiguities as soon as possible before companies start to implement this standard.
- Arvind Sundaramurthy: Concerns are valid, we can meet once a month to address anyone concern as they come up. The feedback can be channeled into the Working Group as the implementation is going along.
- Georgia Jonaris: From implementation perspective, some modifications can have implications on the results implements. Can changes be lumped? So, we can minimize the frequency of changes.
- Arvind Sundaramurthy: Valid point is taken, again, this concern can be handled in the WG meeting.
- Danping Peng: Not entirely sure about the history of path. However, using path can reduce the number of vertexes. There has been study done for variable size and path, so fix path is going to be here and stay. Going curvilinear, the volume will be exploded by ten times. Spline, polygon paths may be the next one, we can add something.
- Patrick LoPresti: There is a need to avoid ambiguity on existing oasis path record. If this standard allows interoperability or someone can define curvy specification, then he would be on board.
- Kurt Wampler: In agreement with Patrick, however this topic should be discussed in the WG. Kurt proposed to have this discussion on the WG agenda. TSMC has experience in this experiment, if they share, that might give us a head start with path.
- Arvind Sundaramurthy: Will discuss in the WG and create a path that make everyone happy. He requests all to join the WG discussion.
- Ulf Weidenmueller: Happy to see this document is completed. He is interested in joining the group.

Result: 11-Y 2-N Voting Result: Pass = 84.62%



Attachment: 03, 6821_Ballot Report

5 Subcommittee and Task Force Reports

5.1 Mask Orders P45 (MALY) Task Force

No report.

5.2 Patterning Metrology Task Force

5.2.1 Bryan Barnes reported ongoing P18 and P19 revisions. There was no push to complete these two revisions. Bryan said these efforts will be abandoned.

- SEMI P18-92 (Reapproved 1104) Specification for Overlay Capabilities of Wafer Steppers
- SEMI P19-92 (Reapproved 0707) Specification for Metrology Pattern Cells for Integrated Circuit Manufacture

5.3 P47 (Line-Edge Roughness) Revision Task Force

5.3.1 Bryan Barnes reported the TF leader, has retired. The effort was faded. Harry Levinson said he had a conversation with Chris Mack on restarting this activity. He will try to contact with Chris and reenergize the group.

6 Old Business

6.1 Standards due for Five-Year Review.

6.1.1 The following standards are due for 5 year review.

- SEMI P39-0416 Specification for OASIS® – Open Artwork System Interchange Standard
- SEMI P44-1216 Specification for Open Artwork System Interchange Standard (OASIS ®) Specific to Mask Tools

Motion: To send P39 and P44 for reapproval ballot.

By: Frank Abboud / Intel

Second: Kurt Wampler / ASML Netherlands BV

Discussion:

Result: 13-Y 0-N Voting Result: Pass - 100.00%.

6.2 SNARFs approaching 3-year Document Development Period

6.2.1 Doc. 6516, Revision to SEMI P47, Test Method for Evaluation of Line-Edge Roughness and Linewidth Roughness, 3 year project is expired.

Motion: Extend P47 SNARF

By: Harry Levinson / HJL Lithography

Second: Frank Abboud / Intel

Discussion:

Result: 9-Y 0-N Voting Result: Pass - 100.00%.

6.3 Previous Action Items

6.3.1 Previous action item shown in table 13 was completed.



7 New Business

7.1 *Action Item Review.*

7.1.1 New action items are captured in table 12.

8 Next Meeting and Adjournment

8.1 The next TC Chapter meeting is set for October 31, 2023 via virtual 9:00 AM – 11:00 AM Pacific.

Respectfully submitted by:

Kevin Nguyen,
SEMI Standards Operations Manager
Phone: 408-943-7997
Email: knguyen@semi.org

Minutes tentatively approved by:

Bryan Barnes (NIST) Co-chair	
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Table 14 Index of Available Attachments^{#1}

<i>Title</i>	
Microlithography NA TC Minutes 07142021.docx	
Staff Report March 2023 v1	
6821_Ballot Report	

^{#1} Due to file size and delivery issues, attachments must be downloaded separately. A .zip file containing all attachments for these minutes is available at www.semi.org. For additional information or to obtain individual attachments, please contact Kevin Nguyen at the contact information above.